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Naval Transformation: Background and Issues for Congress

Ronald O'Rourke
Specialist in National Defense
Foreign Affairs, Defense, and Trade Division

Summary

The Department of the Navy (DoN) has several efforts underway to transform U.S. naval forces to prepare them for future military challenges. The Navy is organizing these efforts under a newly announced conceptual framework called Sea Power 21. Key elements of naval transformation include a focus on operating in littoral waters, network-centric operations, use of unmanned vehicles, new-design ships requiring much-smaller crews, directly supporting Marine expeditionary operations from sea bases, novel naval formations, and new ship-deployment cycles for increasing ship-utilization rates. Naval transformation poses several potential issues for Congress. This report will be updated as events warrant.

Introduction and Issue for Congress

This report focuses on the transformation of U.S. naval forces – the Navy and the Marine Corps, which are both contained in the Department of the Navy (DoN).[1]

Background

What is defense transformation? The Bush Administration has identified transformation as a major goal for the Department of Defense, and has stated that defense programs will be assessed in terms of their potential for contributing to defense transformation.[2] But what is defense transformation?

[1] For a discussion of Army and Air Force transformation efforts, see CRS Report RS20787, *Army Transformation and Modernization: Overview and Issues for Congress*, by Edward F. Bruner. Washington, 2001. (Updated periodically) 6 p.; and CRS Report RS20859, *Air Force Transformation: Background and Issues for Congress*, by Christopher Bolkcom. Washington, 2001. (Updated periodically) 6 p.

[2] See, for example, U.S. Department of Defense. *Quadrennial Defense Review Report*. Washington, 2001. (September 30, 2001) 71 p.

Several definitions of defense transformation have emerged, many of them since early 2001. Some of these definitions are more official than others, and some are more precise or demanding than others. For purposes of this report, defense transformation can be defined as large-scale, discontinuous, and possibly disruptive changes in military weapons, concepts of operations, and organization that are prompted by significant changes in technology or the international security environment. Defense transformation can lead to major changes in the ways in which wars are fought. In contrast to incremental or evolutionary military change brought about by normal modernization efforts, defense transformation is more likely to feature discontinuous or disruptive forms of change.

By most accounts, there have been a few or several such transformations in recent decades or centuries. More recent examples that are sometimes cited include Germany's creation in the 1930s of the concept of rapid blitzkrieg-style warfare, and the U.S. Navy's creation at the same time of long-distance, aircraft carrier-centered naval warfare as a replacement for battleship-centered operations. Some military analysts believe that recent new technologies – including advanced information technologies (IT) for networked operations, distributed sensors, unmanned vehicles, and precision-guided munitions – have set the stage for a new defense transformation. They also believe that U.S. military forces must transform themselves if they are to be adequately prepared for 21st-Century military challenges, particularly so-called asymmetric challenges, in which adversaries avoid competing head-on against current U.S. military strengths.

Transformation advocates believe that a key asymmetric challenge in the next 10 to 25 years will be the development of so-called anti-access or area-denial capabilities – capabilities intended to prevent U.S. military forces from gaining access to the ports, airfields, bases, staging areas, and littoral (near-shore) sea areas that the United States now depends on to mount military operations in distant military theaters. Systems for countering U.S. naval forces in littoral areas could include advanced diesel-electric submarines, mines, anti-ship cruise missiles, air-defense systems, and potentially weapons of mass destruction.

Key transformation advocates include retired Navy Vice Admiral Arthur Cebrowski, former President of the Naval War College and head of DoD's new Office of Force Transformation;[3] Andrew Marshall, the long-time director of DoD's Office of Net Assessment;[4] Andrew Krepinevich, a protégé of Marshall's who is now the Executive Director of the Center for Strategic and Budgetary Assessments (CSBA).[5]

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[3] For a recent example of Cebrowski's views on transformation, see Cebrowski, Arthur. New Rules, New Era. *Defense News*, October 21-27, 2002: 28.

[4] For articles about Andrew Marshall, see Ricks, Thomas E. Warning Shot. *Wall Street Journal*, July 15, 1994: A1, A5; and Winik, Jay. Secret Weapon. *Washingtonian Magazine*, April 1999: 45-55.

[5] For a recent example of a CSBA report with recommendations for implementing defense transformation, see Kosiak, Steven, Andrew Krepinevich, and Michael Vickers. *A Strategy for a Long Peace*. Washington, CSBA, 2001. (January 2001) 80 p.

DoN Transformation Efforts.

Sea Power 21 Transformation Framework. DoN is now organizing its transformation efforts under a newly announced conceptual framework called Sea Power 21, which is built around three main components:

- **Sea Strike**, which refers to the ability of naval forces to project precise and persistent offensive power from the sea;
- **Sea Shield**, which refers to the ability of naval forces to not only defend themselves at sea, but to contribute to homeland defense, project an overland defensive shield to help protect overseas U.S. allies and friends, and provide a sea-based theater and strategic defense against ballistic missiles; and
- **Sea Basing**, which refers to the ability of naval forces to operate at sea, as sovereign entities, free from concerns of access and political constraints associated with using land bases in other countries.

Under the Sea Power 21 framework, these three components are to be supported and bound together by **ForceNet**, which will combine the various computer networks that U.S. naval forces are now fielding into a master computer networking architecture for tying together U.S. naval personnel, ships, aircraft, and installations. An additional part of Sea Power 21 is a **Global Concept of Operations** under which various types of naval formations – carrier strike groups, expeditionary strike groups (i.e., amphibious ships combined with surface combatants and attack submarines), missile defense surface action groups, and modified Trident submarines carrying cruise missiles and special operations forces – are to be used for forward presence, crisis response, and warfighting operations.

Under the Sea Power 21 framework, **Sea Trial** refers to the Navy's process for developing new operational concepts and technologies, **Sea Warrior** refers to the Navy's efforts to train its personnel for operating a transformed force, and **Sea Enterprise** refers to the Navy's efforts to improve its organization, processes, and business practices so as to generate savings that can be invested in transformation.[6]

Transformation Centers, Exercises, and Experiments. Many DoN transformation activities efforts take place at the Navy Warfare Development Command (NWDC), which is located at the Naval War College at Newport, RI, and the Marine Corps Warfighting Laboratory (MCWL), which is located at the Marine Corps Base at Quantico, VA. These two organizations generate ideas for naval transformation and act as clearinghouses and evaluators of transformation ideas generated in other parts of DoN. NWDC and MCWL oversee major exercises, known as Fleet Battle Experiments (FBEs) and Advanced Warfighting Experiments (AWEs), that are intended to explore new naval operational concepts. The Navy and Marine Corps also participate with the Army and Air Force in joint exercises aimed at testing transformation ideas.

Key Features of Naval Transformation. Table 1 below summarizes several key features of U.S. naval transformation.

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[6] For a detailed and authoritative discussion of the Sea Power 21 framework authored by the current Chief of Naval Operations, see Clark, Vern. Sea Power 21, Projecting Decisive Joint Capabilities. *U.S. Naval Institute Proceedings*, October 2002: 32-41.

Table 1. Key Features of U.S. Naval Transformation

Previous U.S. naval forces	Transformed U.S. naval forces
Plan for stand-alone, mid-ocean operations against Soviet naval forces	Plan for joint operations in littoral waters against land- and sea-based forces of regional adversaries
Platform-centric operations	Network-centric operations
Manned platforms only	Significant use of unmanned vehicles
Manpower-intensive ships; people treated as a "free good"	Ships with smaller ("lean," optimal) crews; cost of personnel fully recognized
Multiple aircraft sorties per target	Multiple targets per aircraft sortie
Bases, logistic "piles" established ashore for Marine expeditionary operations	Marine expeditionary operations ashore supported directly from sea bases
Stealth mostly in submarines and SEALs	Stealth spreads to aircraft, surface ships
Primary reliance on carrier battle groups and amphibious ready groups	Use of more novel, flexible formations, such as expeditionary strike groups
Traditional ship-deployment cycles	New ship-deployment cycles for increased ship-utilization rates
Traditional business practices	Streamlined, reformed practices

The shift in the focus of Navy planning away from the Cold War scenario of countering Soviet naval forces in mid-ocean waters and toward the post-Cold War scenario of operating in littoral (near-shore) waters to counter the land- and sea-based forces of potential regional aggressors began in late 1992 with the publication of a Navy document entitled ... *From the Sea*. In retrospect, this shift can be recognized as a major element of Navy transformation that has led to numerous changes in naval concepts of operation, training, and equipment. Among other things, it moved the focus of Navy planning from a geographic environment where it could expect to operate primarily by itself to one where it would likely operate in a joint manner, alongside other U.S. forces.

The concept of network-centric operations, also called network-centric warfare (NCW), is a key feature of transformation for all U.S. military services. The concept, which emerged in the late 1990s, involves using computer networking technology to tie together personnel, ships, aircraft, and installations in a series of local and wide-area networks capable of rapidly transmitting critical information. Many in DoN believe that NCW will lead to changes in naval concepts of operation and significantly increase U.S. naval capabilities and operational efficiency. Key NCW efforts include the Navy's Cooperative Engagement Capability (CEC) network for air-defense operations, the Naval Fires Network (NFN) for gun and missile fire support operations, the IT-21 investment strategy, which is creating a corporate intranet for Navy ships at sea, and the above-

mentioned ForceNet program. A related program is the Navy/Marine Corps Intranet (NMCI), which is creating a network to link together DoN installations.[7]

Many analysts believe that unmanned vehicles will be another central feature of U.S. military transformation. DoN in coming years will likely acquire a variety of unmanned air, surface, underwater and ground vehicles.[8]

Future Navy ships are to have much smaller crews than today's ships. Personnel-related costs are a major contributor to the total life-cycle cost of Navy ships, and new technologies for automated ship operation and damage control permit the design of ships with so-called "lean" or optimal manning. Current Navy ship-acquisition programs related to this goal include the DD(X) destroyer[9] and the Littoral Combat Ship (LCS).[10]

The advent of air-launched precision-guided munitions (PGMs) and associated targeting systems now permits U.S. strike aircraft, including Navy carrier-based strike-fighters, to attack multiple targets during a single sortie – a major reversal from the previous situation of having to use multiple aircraft sorties to attack a single target.[11] As a result, naval aviation officials believe that a carrier air wing in coming years might be able to attack more than 1,000 separate target aim points during a 24-hour period, a several-fold increase over the older figure. The Navy argues that its planned CVNX-1 aircraft carrier is central to naval aviation transformation.[12]

Within the Navy's Sea Power 21 transformation framework, the Marine Corps is using the term sea basing in a more specific way, to refer to a new operational concept under which the Marines would not establish bases and logistic "piles" ashore to support Marine expeditionary operations, but would instead support such operations directly from sea bases. A key program related to this concept is the Maritime Prepositioning Force of the Future (MPF[F]), which would replace the Corps' current maritime prepositioning

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[7] For a discussion of NCW, CEC, NFN, IT-21, ForceNet, and NMCI, see CRS Report RS20557, *Navy Network-Centric Warfare Concept: Key Programs and Issues for Congress*, by Ronald O'Rourke. Washington, 2002. 6 p. (Updated periodically)

[8] For more on naval unmanned vehicle programs, see CRS Report RS21294, *Unmanned vehicles for U.S. Naval Forces: background and issues for Congress*, by Ronald O'Rourke. Washington, 2002. (Updated periodically) 6 p.

[9] For more on the DD(X) destroyer, see CRS Report RS21059, *Navy DD(X) Future Surface Combatant Program: Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2002. (Updated periodically) 6 p.

[10] For more on the LCS, see CRS Report RS21305, *Navy Littoral Combat Ship (LCS): Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2002. (Updated periodically)

[11] For more on air-launched PGMs, see CRS Report RL30552, *Missiles for Standoff Attack: Air-launched Air-to-Surface Munitions Programs*, by Christopher Bolkcom. Washington, 2000. (Updated periodically) 25 p.

[12] For more on the CVNX, see CRS Report RS20643, *Navy CVNX aircraft carrier program: background and issues for Congress*, by Ronald O'Rourke. Washington, 2002. (Updated periodically) 6 p.

ships with new-design ships capable of supporting Marine expeditionary operations in this manner.

For many years, submarines and naval special operations forces (called SEALs for Sea, Air, and Land) were the primary naval forces employing stealth. DoN plans to spread the use of stealth in naval forces to aircraft and surface ships through programs such as the Joint Strike Fighter (JSF),[13] the DD(X) destroyer, and the LCS.

The Navy in the past has relied on carrier battle groups (CVBGs) and amphibious ready groups (ARGs) as its standard or "canonical" ship formations. As mentioned earlier, as part of its new Global Concept of Operations, the Navy plans to begin using more novel formations – such as expeditionary strike groups, missile defense surface action groups, and modified Trident submarines carrying cruise missiles and special operations forces – for forward presence, crisis response, and warfighting operations.[14]

The Navy is beginning to experiment with new ship-deployment concepts – such as multiple crewing and long-duration deployments with crew rotation – that could achieve a significant reduction in Navy stationkeeping multipliers, which are the numbers of Navy ships of a certain kind that are needed to keep one such ship on station in an overseas operating area. Such new ship-deployment concepts, if implemented widely, could permit a Navy of fewer ships to maintain a given level of naval forward presence.[15]

DoN is pursuing a variety of strategies to improve its processes and business practices so as to generate savings that can be used to help finance Navy transformation. As mentioned earlier, under the Sea Power 21 framework, these efforts are referred to collectively as Sea Enterprise.

Issues for Congress

In assessing current DoN transformation efforts, potential questions for Congress include the following: Are current DoN transformation efforts inadequate, excessive, or about right? Does DoN have an adequate roadmap for guiding its transformation efforts? Is DoN placing too much or too little emphasis on certain components of transformation? Is DoN achieving a proper balance between transformation and potentially competing program goals, such as maintaining near-term readiness and near-term equipment procurement? Are DoN transformation efforts adequately coordinated with those of the Army and Air Force? Is there sufficient consensus on the definition of transformation, and over which programs or efforts might qualify as transformational? Is transformation being abused as an all-purpose tool for justifying or opposing certain programs?

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[13] For more on the JSF, see CRS Report RL30563, *Joint Strike Fighter (JSF) Program: Background, Status, and Issues*, by Christopher Bolkcom. Washington, 2002. (Updated periodically) 6 p.

[14] For more on the modified Trident submarines, see CRS Report RS21007, *Navy Trident Submarine Conversion (SSGN) Program: Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2002. (Periodically updated) 6 p.

[15] For more on potential new ship-deployment cycles, see CRS Report RS20338, *Navy Ship-Deployment Cycles: Potential New Methods – Background and Issues for Congress*, by Ronald O'Rourke. Washington, 2002. (Periodically updated) 6 p.